The Sad Story of Allan Lake

By Tom Runyon, hydrologist, Red Rock Ranger District, February 2020

If you read my January 2020 hydrobit titled “Is it really a lake?”, you’ll know that many features with the name “lake” in them are not really lakes. Allan Lake is one such feature. Identified in the National Wetlands Inventory as an intermittently flooded wetland, this roughly 23 acre seasonal water feature is on the west side of Lake Mary Road (FH-3) roughly 7 miles south of Mormon Lake (see photo 1). The story of Allan Lake is a cautionary tale of what can go wrong when humans attempt to “improve” on Mother Nature. It is part of the larger story of the loss of over 50% of wetland habitat in the United States since the American revolution (Dahl, 1990).

Photo 1 – Allan Lake as it existed before it was altered in an attempt to improve nesting habitat for waterfowl. Note the abundant emergent wetland vegetation including various species of rush.

Humans have been tinkering with Allan Lake since 1945 when Southwest Forest Industries constructed a railroad landing near Allan Lake (see photo 2) and used water from an excavated portion of the wetland for their steam locomotive (Hibbens, 1967). This steam locomotive was used to transport harvested logs to a lumber mill in Flagstaff that was located where the aptly named shopping plaza *Aspen Place at the Sawmill* is now located.

Photo 2 – Allan Lake landing as it existed in the late 1960s after removal of the railroad tracks. The landing is located on the east side of Lake Mary Road.

In the late 1960s, water was again extracted from Allan Lake this time for use in the re-construction of FH-3. At this time, the City of Flagstaff, local sportsmen, and others were suggesting the possibility of diverting water from the wetland for supplementing the City's water supply. This idea was never pursued for a variety of reasons but another proposal to deepen the wetland in order to improve nesting habitat for waterfowl was eventually implemented. And here the story gets very interesting yet very disturbing.

The Forest Service publication *Management of Wetlands at High Altitudes in the Southwest* was written in response to a growing public awareness of the importance of wetlands coupled with a decline in waterfowl populations (Frederickson and Dugger, 1993). It is this latter consideration that led to a proposal that now seems outrageous to those of us concerned with resource protection and, in particular, wetlands preservation.

The idea of improving nesting habitat for waterfowl in wetlands through topographic manipulation has probably been around for some time but the particular method of topographic manipulation through blasting dates back to at least the mid-1960s (USDA FS, 1965). In the aforementioned publication, blasting is identified as a strategy to increase wetland depth and flooding duration in order to improve waterfowl nesting habitat.

I have in my possession a fairly thick folder of correspondence surrounding planning efforts to improve waterfowl nesting habitat at Allan Lake and various other wetlands in northern Arizona through topographic manipulation. It would appear that in the 1980s, blasting was the method of choice for topographic manipulation and many wetlands in northern Arizona were altered by dynamite during this period. In 1987, Ducks Unlimited, Arizona Game and Fish, and the Coconino National Forest partnered to implement a project to improve nesting habitat at Allan and Blind lakes described as follows:

> The idea of the project is to create island nesting habitat to be used by waterfowl. Ammonium nitrate (Anfo) will be used to blast a channel encircling both areas with radial trenches running towards the center. This will create a maximum amount of shore with the area available.

With nothing more than a letter to the file (preparation of an EA was deemed unnecessary), 15 cases of dynamite, and 37,500 pounds of ammonium nitrate, blasting was commenced in 1987 (see photo 3).

Photo 3 – Actual blasting of Allan Lake to create a circular trench encircling the wetland with various "spokes" radiating from it (see photo 4).

The blasting certainly accomplished the goal of creating a circular trench surrounding the wetland with linear trenches in the form of spokes radiating outward from its center (see photo 4). Unfortunately, it appears no one thought to characterize the subsurface prior to blasting. If they had done so, they would have realized that the natural clay layer underlying the wetland and maintaining saturated conditions at or near the surface during at least a portion of the growing season was not very thick. Blasting compromised the clay layer exposing a much more permeable underlying layer.

Photo 4 – Allan Lake much as it looks today as viewed from above in Google Earth. Trenches are roughly 30' wide by 6' deep with roughly 1:1 side slopes.

Water was now able to drain much more rapidly from the wetland bottom. The overall effect was to reduce the area that is seasonally saturated converting areas previously dominated by wetland plant species to upland grasses and forbs. You won't find any emergent vegetation like that shown in photo1 at Allan Lake any longer.

In 2015, I was part of an effort to rehabilitate a portion of the former wetland by attempting to redistribute displaced soil to fill the trenches created by blasting. The hope was that we could restore the relatively impermeable clay layer that was previously compromised. We were able to partially fill in the trenches surrounding one part of the wetland but the displaced clay soil was so thoroughly mixed with the underlying more permeable soil that we could not re-create the pre-disturbance soil profile. In essence, we found it nearly impossible to put Humpty Dumpty back together again.

The most recent chapter in this sad story involves a Forest Service system road that cuts through a portion of the wetland resulting in a fairly wide swath of disturbance as vehicles attempt to make their way across a surface that is seasonally saturated (see photo 5). It would be a shame if this were the end of the Allan Lake story…..

Photo 5 – Forest Service Road 935 where it extends across the edge of Allan Lake. Vehicles attempting to navigate the morass have left behind a swath of disturbance.

References:

Dahl, Thomas E., 1990, *Wetlands loss since the revolution*, U.S. Fish and Wildlife Service National Wetlands Newsletter – November/December 1990 available at: https://www.fws.gov/wetlands/Documents%5CWetlands-Loss-Since-the-Revolution.pdf

Fredrickson, L.H and B.D. Dugger, 1993, *Management of Wetlands at High Altitudes in the Southwest*, USDA Forest Service, Region 3.

Hibbens, J., 1967, *Allan Lake Watershed Hydrologic Analysis*. Coconino National Forest.

USDA Forest Service, 1965, *Wetlands of the Chippewa National Forest Wildlife Management Plan*.